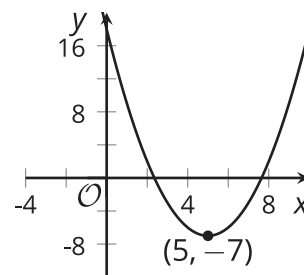# Lesson 17 Practice Problems

1. Here the graph of quadratic function f.

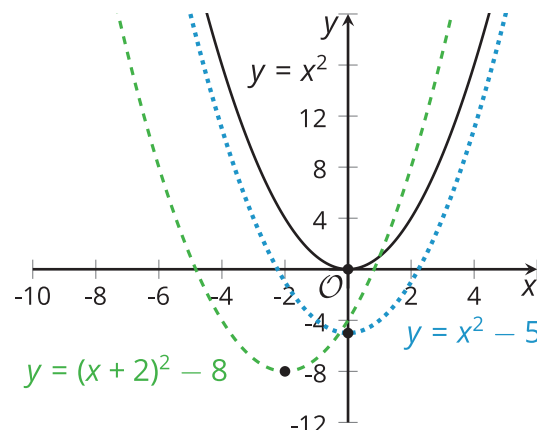   Andre uses the expression $(x - 5)^2 + 7$ to define f.

   Noah uses the expression $(x + 5)^2 - 7$ to define f.

   Do you agree with either of them? Explain your reasoning.

2. Here are the graphs of $y = x^2$, $y = x^2 - 5$, and $y = (x+2)^2 - 8$.

    a. How do the 3 graphs compare?

    b. Compare the graphs of $y = x^2$ and $y = x^2 - 5$. What role does the -5 play in the comparison?

    c. Compare the graphs of $y = x^2$ and $y = (x+2)^2 - 8$. What role does the +2 play in the comparison?

3. Which equation represents the graph of $y = x^2 + 2x - 3$ moved 3 units to the left?

    A. $y = x^2 + 2x - 6$

    B. $y = (x+3)^2 + 2x - 3$

    C. $y = (x+3)^2 + 2(x+3)$

    D. $y = (x+3)^2 + 2(x+3) - 3$

4. Select **all** the equations with a graph whose vertex has *both* a positive x- and a positive y-coordinate.

A. $y = x^2$

B. $y = (x - 1)^2$

C. $y = (x - 3)^2 + 2$

D. $y = 2(x - 4)^2 - 5$

E. $y = 0.5(x + 2)^2 + 6$

F. $y = \text{-}(x - 4)^2 + 3$

G. $y = \text{-}2(x - 3)^2 + 1$

5. The height in feet of a soccer ball is modeled by the equation $g(t) = 2 + 50t - 16t^2$, where time t is measured in seconds after it was kicked.

   a. How far above the ground was the ball when kicked?

   b. What was the initial upward velocity of the ball?

   c. Why is the coefficient of the squared term negative?

(From Unit 6, Lesson 14.)

6. a. What is the vertex of the graph of the function f defined by $f(x) = -(x-3)^2 + 6$?

b. Identify the y-intercept and one other point on of the graph of this function.
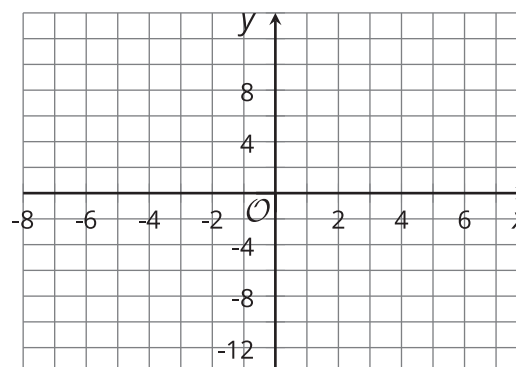
c. Sketch the graph of f.
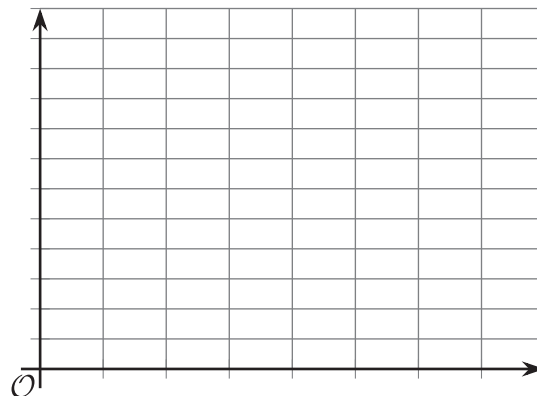
(From Unit 6, Lesson 16.)

7. At 6:00 a.m., Lin began hiking. At noon, she had hiked 12 miles. At 4:00 p.m., Lin finished hiking with a total trip of 26 miles.

During which time interval was Lin hiking faster? Explain how you know.

(From Unit 4, Lesson 7.)

8. Kiran bought a smoothie every day for a week. Smoothies cost $3 each. The amount of money he spends, in dollars, is a function of the number of days of buying smoothies.

   a. Sketch a graph of this function. Be sure to label the axes.

   b. Describe the domain and range of this function.

(From Unit 4, Lesson 11.)

9. A deposit of $500 has been made in an interest-bearing account. No withdrawals or other deposits (aside from earned interest) are made for 5 years.

   Write an expression to represent the account balance for each of the following situations.

   a. 6.5% annual interest calculated monthly

   b. 6.5% annual interest calculated every two months

   c. 6.5% annual interest calculated quarterly

   d. 6.5% annual interest calculated semi-annually

(From Unit 5, Lesson 18.)

10. *Technology required.* Function h is defined by $h(x) = 5x + 7$ and function k is defined by $k(x) = (1.005)^x$.

    a. Complete the table with values of $h(x)$ and $k(x)$. When necessary, round to 2 decimal places.

    b. Which function do you think *eventually* grows faster? Explain your reasoning.

x	$h(x)$	$k(x)$
1		
10		
50		
100		

    c. Use graphing technology to verify your answer to the previous question.

(From Unit 5, Lesson 19.)